



Ash Creek Associates, Inc.

Environmental and Geotechnical Consultants

November 8, 2011

Mr. Dwight Leisle
Port of Portland
7200 NE Airport Way
Portland, Oregon 97218

Re: Proposed Riverbank Sampling — Operable Unit 3
Swan Island Upland Facility
Portland, Oregon
ECSI No. 271
1115-05

Dear Mr. Leisle:

This letter presents the proposed riverbank sampling activities to support the Port of Portland (Port) no further action (NFA) request for Operable Unit 3 (the Facility or OU3) at the Swan Island Upland Facility (SIUF) in Portland, Oregon (Figures 1 and 2). The Port is under a Voluntary Cleanup Program (VCP) Agreement with the Oregon Department of Environmental Quality (DEQ) for Remedial Investigation (RI), Source Control Measures (SCMs), and Feasibility Study (FS) at the Facility (dated July 24, 2006). The proposed activities presented in this letter include a detailed riverbank reconnaissance and collection of surface soil samples for chemical analysis.

BACKGROUND

Ash Creek completed a visual reconnaissance of the OU1 riverbank as part of the Source Control Evaluation (SCE) currently under preparation for that OU. A wooden retaining wall was identified that appears to run the length of the lagoon side of the Facility (including OU3). Portions of the retaining wall have deteriorated, leading to some loss of the riverbank (Photographs 1 and 2; Attachment A). The remainder of the retaining wall is bowing under the pressure of the riverbank material, which could lead to a potential failure (Photograph 3). The activities proposed in this Work Plan are necessary to understand the significance of the past and potential future erosion.

PROPOSED FIELD ACTIVITIES

Preparatory Activities

The following activities and schedule coordination will be completed in preparation for the field work.

- **Health and Safety Plan (HASP).** Ash Creek will prepare a HASP for its personnel involved with the project.
- **Tenant Coordination.** The work activities will be conducted in coordination with Port and tenant schedules (as necessary).

Riverbank Reconnaissance

Ash Creek will complete a detailed visual reconnaissance of the OU3 riverbank. The entire length of the bank will be observed and mapped. Due to the presence of heavy vegetation (Photographs 1 through 4) and the steepness of the riverbank slope, the reconnaissance will be completed using visual observations made from the berths and foot pier. Additional observations will be made during the sampling described below.

Soil Sampling

Figure 3 shows the general proposed locations of the soil sampling locations. Final locations will be established based on observations of erodible soil. Due to the presence of heavy vegetation and the steepness of the riverbank slope, the riverbank will be accessed via a small boat.

Five total samples are planned (OU3-RB-1 through OU3-RB-5). The samples will be collected in accordance with Standard Operating Procedure (SOP) 2.2 (Attachment B). The samples will be field screened for volatile organic compounds (VOCs) using a photoionization detector (PID) and for the presence of petroleum hydrocarbons using a sheen test in accordance with SOP 2.1. The soil conditions where each sample is collected will be described in the field notes. The sample locations will be recorded using a high-accuracy, handheld global positioning system (GPS) device (Trimble® GeoXH™).

CHEMICAL ANALYSES

The Facility is adjacent to Portland Harbor Superfund Site Area of Potential Concern (AOPC) 17S. Contaminants of potential concern (COPCs) in AOPC 17S include polychlorinated biphenyls (PCBs), metals, polycyclic aromatic hydrocarbons (PAHs), and tributyltin (TBT). Therefore, soil samples will be submitted for the following chemical analyses on a normal turnaround basis. Target reporting limits are presented in Table 1.

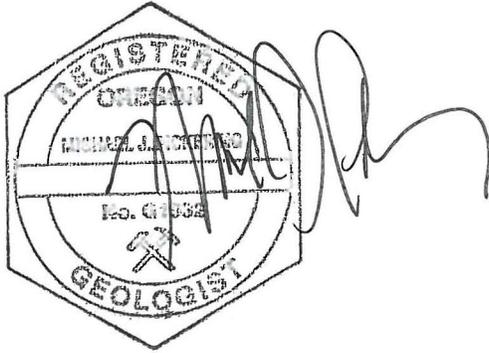
- PCBs by EPA Method 8082 (Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268).
- Priority pollutant 13 metals by EPA 6000/7000 Series Methods;
- PAHs by EPA Method 8270-SIM; and
- Butyl tins by the Krones Method.

REPORTING

The results of the sampling will be presented in a letter report.

If you have any questions regarding these activities, please contact the undersigned at (503) 924-4704.

Sincerely,



Michael J. Pickering, R.G.
Associate Hydrogeologist

ATTACHMENTS

Table 1 – Target Reporting Limits

Figure 1 – Facility Location Map

Figure 2 – Site Vicinity Map

Figure 3 – Proposed Sampling Plan

Attachment A – Photograph Log

Attachment B – Standard Operating Procedures 2.1 and 2.2

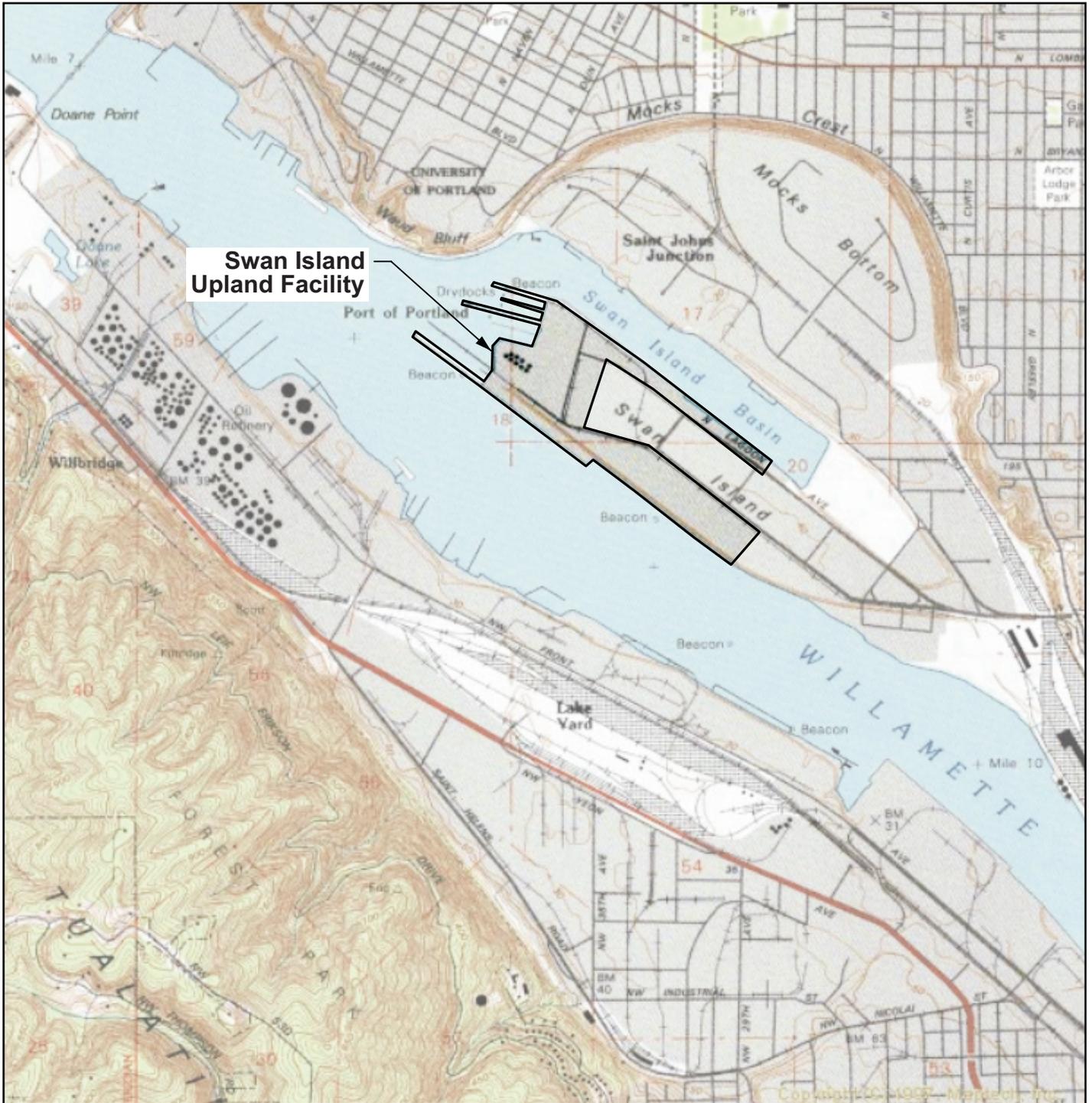


Table 1 - Target Reporting Limits
Swan Island Upland Facility, OU3
Portland, Oregon

Analyte	Soil			
	Units	MDL	MRL	JSCS
Polychlorinated Biphenyls (EPA Method 8082)				
Aroclor 1016	ug/kg	5	17	530
Aroclor 1221	ug/kg	3	17	--
Aroclor 1232	ug/kg	4	17	--
Aroclor 1242	ug/kg	5	17	--
Aroclor 1248	ug/kg	5	17	1,500
Aroclor 1254	ug/kg	3	17	300
Aroclor 1260	ug/kg	6	17	200
Aroclor 1262	ug/kg	2	17	--
Aroclor 1268	ug/kg	2	17	--
Metals (EPA 6000/7000 Series Methods)				
Antimony	mg/kg	0.11	0.1	64
Arsenic	mg/kg	0.18	0.5	7
Beryllium	mg/kg	0.052	0.2	--
Cadmium	mg/kg	0.25	0.5	1
Chromium	mg/kg	0.25	0.5	111
Copper	mg/kg	0.2	0.5	149
Lead	mg/kg	0.02	0.1	17
Nickel	mg/kg	0.14	0.5	49
Selenium	mg/kg	0.15	0.5	5
Silver	mg/kg	0.23	0.5	5
Thalium	mg/kg	0.018	0.1	--
Zinc	mg/kg	0.3	5	459
Mercury	mg/kg	0.0045	0.01	0.07
Polycyclic Aromatic Hydrocarbons (EPA Method 8270-SIM)				
1-Methylnaphthalene	ug/kg	0.9	6.7	--
2-Methylnaphthalene	ug/kg	1.8	6.7	200
Acenaphthene	ug/kg	1.5	6.7	300
Acenaphthylene	ug/kg	0.2	6.7	200
Anthracene	ug/kg	0.4	6.7	845
Benzo(a)anthracene	ug/kg	0.1	6.7	--
Benzo(a)pyrene	ug/kg	0.2	6.7	--
Benzo(b)fluoranthene	ug/kg	0.7	6.7	--
Benzo(ghi)perylene	ug/kg	0.3	6.7	--
Benzo(k)fluoranthene	ug/kg	0.5	6.7	--
Chrysene	ug/kg	0.3	6.7	1,290
Dibenz(a,h)anthracene	ug/kg	0.3	6.7	--
Fluoranthene	ug/kg	0.8	6.7	2,230
Fluorene	ug/kg	0.8	6.7	536
Indeno(1,2,3-cd)pyrene	ug/kg	0.3	6.7	--
Naphthalene	ug/kg	1.8	6.7	561
Phenanthrene	ug/kg	3.1	6.7	1,170
Pyrene	ug/kg	0.3	6.7	1,520
Butyl Tins (Krones Method)				
Tributyltin Ion	ug/kg	1.4	4	2.3
Dibutyltin Ion	ug/kg	4.0	6	--
Butyltin Ion	ug/kg	2.0	4	--
Tetrabutyltin	ug/kg	2.0	4	--

Notes:

1. -- = Not available or not applicable.
2. MDL = Method detection limit (MDL).
3. MRL = Method reporting limit (MRL).
4. JSCS = Screening levels from Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005



Note: Base map prepared from USGS 7.5-minute quadrangles as provided by Topozone. (1990)

0 2,000 4,000

Approximate Scale in Feet



Portland



Facility Location Map

Riverbank Surface Soil Sampling Work Plan
Swan Island Upland Facility, Operable Unit 3
Portland, Oregon

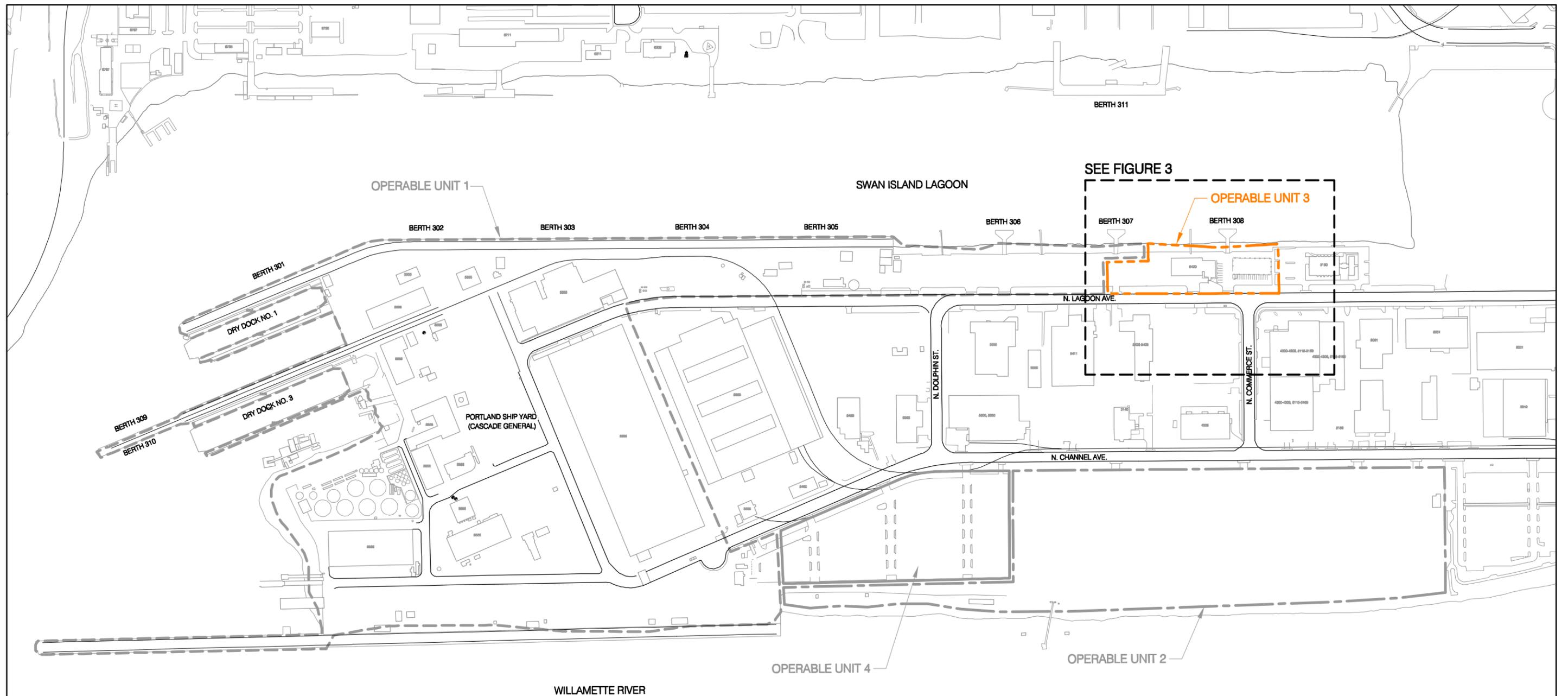
 Ash Creek Associates, Inc.
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Project Number 1115-08

October 2011

Figure

1



Legend:

- Operable Unit 1 Boundary
- Operable Unit 2 Boundary
- Operable Unit 3 Boundary
- Operable Unit 4 Boundary

NOTE:

1. Prepared from AutoCAD base map received from the Port of Portland in June 2007.

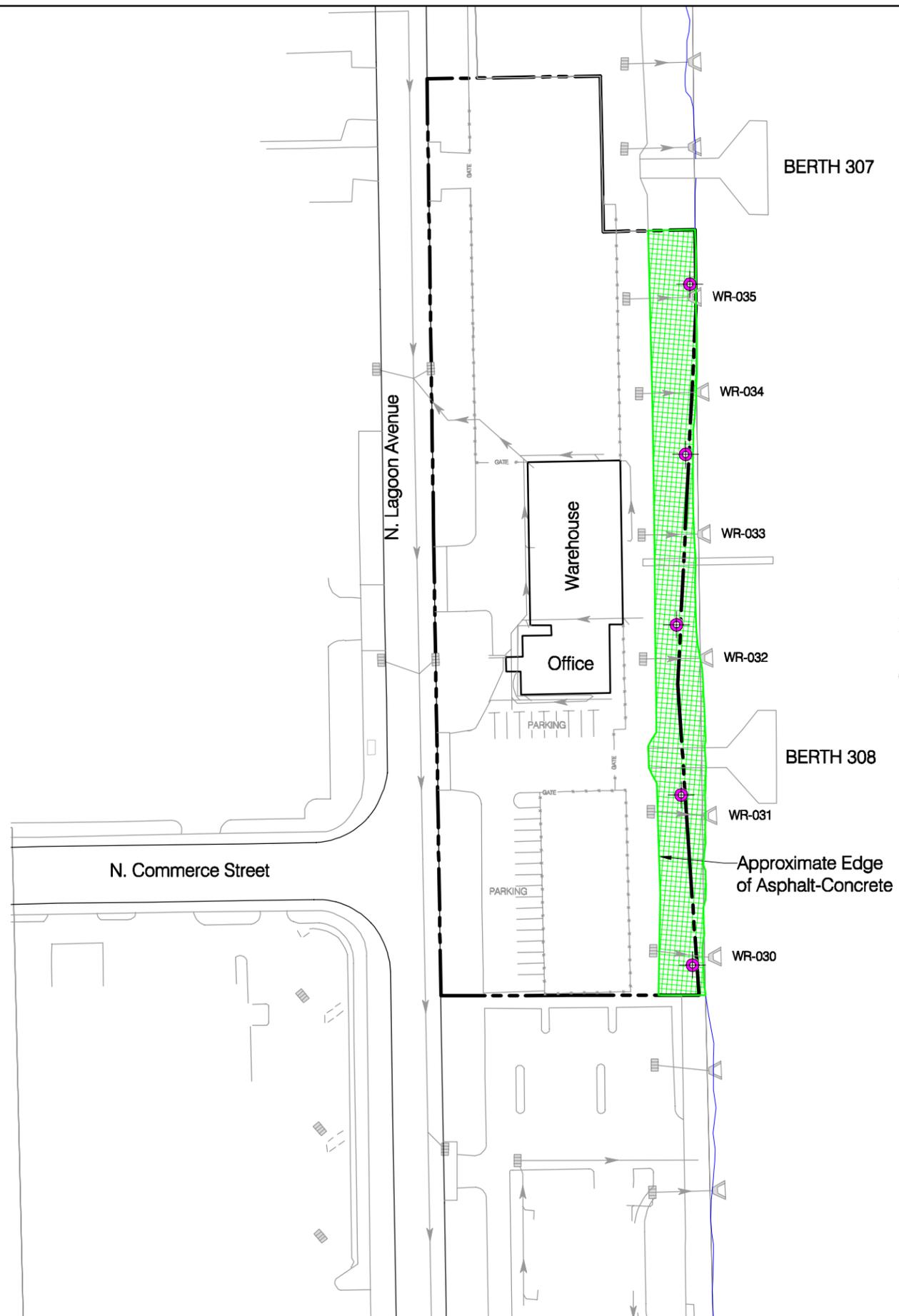


Site Vicinity Map

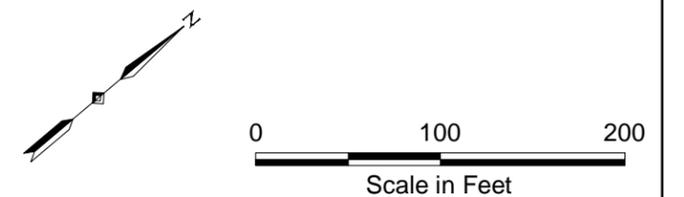
Riverbank Surface Soil Sampling Work Plan
Swan Island Upland Facility, Operable Unit 3
Portland, Oregon



Project Number	1115-08	Figure
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- Legend:**
- Proposed Riverbank Soil Sampling Location
 - Operable Unit 3 Boundary
 - WR-035 Inlet and Outfall Pipe and Number
 - Storm Sewer Line and Flow Direction
 - Catch Basin
 - Riverbank Area



Proposed Sampling Plan
 Riverbank Surface Soil Sampling Work Plan
 Swan Island Upland Facility, Operable Unit 3
 Portland, Oregon

Ash Creek Associates, Inc. <small>Environmental and Geotechnical Consultants</small>	Project Number	1115-08	Figure
	October 2011		3

NOTE:
 1. Prepared from AutoCAD base map received from the Port of Portland in June 2007.

Attachment A

Photograph Log

ATTACHMENT A PHOTOGRAPH LOG

Project Name: Swan Island Upland Facility, OU3
Project Number: 1115-08

Client: Port of Portland
Location: Portland, Oregon

Photo No: 1	
Photo Date: August 5, 2011	
Orientation: Northwest	
Description: Photograph taken from Berth 308 on OU3. Foot pier between Berths 307 and 308 in top of photograph. White bracket highlights missing section of wooden retaining wall. Corrugated outfall pipe in center of photograph is WR-032.	

Photo No: 2	
Photo Date: October 10, 2011	
Orientation: Southwest	
Description: Photograph taken from boat on lagoon looking toward OU3 riverbank and warehouse. Foot pier between Berths 307 and 308 in right of photograph. Black bracket highlights missing section of wooden retaining wall shown in Photograph 1.	

ATTACHMENT A PHOTOGRAPH LOG

Project Name: Swan Island Upland Facility, OU3
Project Number: 1115-08

Client: Port of Portland
Location: Portland, Oregon

Photo No: 3	
Photo Date: August 5, 2011	
Orientation: Southeast	
Description: Photograph taken from Berth 307 looking at riverbank (OU3 riverbank is past rope into frame of photograph). Note how riverbank material is causing wooden retaining wall to bow under pressure.	

Photo No: 4	
Photo Date: October 10, 2011	
Orientation: Southwest	
Description: Photograph taken from boat on lagoon looking toward OU3 riverbank. Corrugated outfall pipe in left of photograph is WR-030.	

Attachment B

Standard Operating Procedures 2.1 and 2.2

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides instructions for standard field screening. Field screening results are used to aid in the selection of soil samples for chemical analysis. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling operations.

Standard field screening techniques include the use of a photoionization detector (PID) to assess for volatile organic compounds (VOCs), for the presence of separate-phase petroleum hydrocarbons using a sheen test. These methods will not detect all potential contaminants, so selection of screening techniques shall be based on an understanding of the site history. The PID is not compound or concentration-specific, but it can provide a qualitative indication of the presence of VOCs. PID measurements are affected by other field parameters such as temperature and soil moisture. Other field screening methods, such as screening for dense non-aqueous phase liquid (DNAPL) using dye or UV light, are not considered "standard" and will be detailed in the site-specific sampling and analysis plan (SAP).

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- PID with calibration gas (record daily calibration/calibration check in field notes);
- Plastic resealable bags (for PID measurement); and
- Glass jars or stainless steel bowls (for sheen testing).

3. METHODOLOGY

Each soil sample will be field screened for VOCs using a PID and for the presence of separate-phase petroleum hydrocarbons using a sheen test. If the presence of DNAPL is suspected, then screening using dye and UV light may also be completed. For information regarding screening using dye or UV light, refer to the site specific sampling and analysis plan.

PID lamps come in multiple sizes, typically 9.8, 10.6, and 11.7 electron volts (eV). The eV rating for the lamp must be greater than the ionization potential (in eV) of a compound in order for the PID to detect the compound. For petroleum hydrocarbons, a lamp of at least 9.8 eV should be used. For typical chlorinated alkenes (dichloroethene, trichloroethene, tetrachloroethene, or vinyl chloride.), a lamp of at least 10.6 eV should be used. The compatibility of the lamp size with the site constituents should be verified prior to the field event and will be detailed in the site-specific SAP.

PID Calibration Procedure: The PID used on-site should be calibrated daily or more frequently if needed. Calibration of the PID should be documented in field notes. Calibrations procedures should be conducted according to the manufacturer's instructions.

PID Screening Procedure:

- Place a representative portion (approximately one ounce) of freshly exposed, uncompacted soil into a clean resealable plastic bag.
- Seal the bag and break up the soil to expose vapors from the soil matrix.
- Allow the bag to sit to reach ambient temperature. Note: Ambient temperature and weather conditions/humidity should be recorded in field notes. Changes in ambient temperature and weather during the field work should also be recorded, as temperature and humidity can affect PID readings.
- Carefully insert the intake port of the PID into the plastic bag.
- Record the PID measurement in the field notes or boring logs.

Sheen Test Procedure:

- Following the PID screen, place approximately one ounce of freshly exposed, uncompacted soil into a clean glass jar or stainless steel bowl.

- Add enough water to cover the sample.
- Observe the water surface for signs of discoloration/sheen and characterize

No Sheen (NS)	No visible sheen on the water surface
Biogenic Film (BF)	Dull, platy/blocky or foamy film.
Slight Sheen (SS)	Light sheen with irregular spread, not rapid. May have small spots of color/iridescence. Majority of water surface not covered by sheen.
Moderate Sheen (MS)	Medium to heavy coverage, some color/iridescence, spread is irregular to flowing. Sheen covering a large portion of water surface.
Heavy Sheen (HS)	Heavy sheen coverage with color/iridescence, spread is rapid, entire water surface covered with sheen. Separate-phase hydrocarbons may be evident during sheen test.

1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods used for obtaining surface soil samples for physical and/or chemical analysis. For purposes of this SOP, surface soil (including shallow subsurface soil) is loosely defined as soil that is present within 3 feet of the ground surface at the time of sampling. Various types of sampling equipment are used to collect surface soil samples including spoons, scoops, trowels, shovels, and hand augers.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Spoons, scoops, trowels, shovels, and/or hand augers. Stainless steel is preferred.
- Stainless steel bowls
- Laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by Health and Safety Plan)

3. METHODOLOGY

Project-specific requirements will generally dictate the preferred type of sampling equipment used at a particular site. The following parameters should be considered: sampling depth, soil density, soil moisture, use of analyses (e.g., chemical versus physical testing), type of analyses (e.g., volatile versus non-volatile). Analytical testing requirements will indicate sample volume requirements that also will influence the selection of the appropriate type of sampling tool. The project sampling plan should define the specific requirements for collection of surface soil samples at a particular site.

Collection of Samples

- **Volatile Analyses.** Surface soil sampling for volatile organics analysis (VOA) is different than other routine physical or chemical testing because of the potential loss of volatiles during sampling. To limit volatile loss, the soil sample must be obtained as quickly and as directly as possible. If a VOA sample is to be collected as part of a multiple analyte sample, the VOA sample portion will be obtained first. The VOA sample should be obtained from a discrete portion of the entire collected sample and should not be composited or homogenized. Sample bottles should be filled to capacity, with no headspace. Specific procedures for collecting VOA samples using the EPA Method 5035 are discussed in SOP 2-7.
- **Other Analyses.** Once the targeted sample interval has been collected, the soil sample will be thoroughly homogenized in a stainless steel bowl prior to bottling. Sample homogenizing is accomplished by manually mixing the entire soil sample in the stainless steel bowl with the sampling tool or with a clean teaspoon or spatula until a uniform mixture is achieved. If packing of the samples into the bottles is necessary, a clean stainless steel teaspoon or spatula may be used.

General Sampling Procedure:

- Decontaminate sampling equipment in accordance with the Sampling and Analysis Plan (SAP) before and after each individual soil sample.
- Remove surface debris that blocks access to the actual soil surface or loosen dense surface soils, such as those encountered in heavy traffic areas. If sampling equipment is used to remove surface debris,

the equipment should be decontaminated prior to sampling to reduce the potential for sample interferences.

- When using a hand auger, push and rotate downward until the auger becomes filled with soil. Usually a 6- to 12-inch long core of soil is obtained each time the auger is inserted. Once filled, remove the auger from the ground and empty into a stainless steel bowl. If a VOA sample is required, the sample should be taken directly from the auger using a teaspoon or spatula and/or directly filling the sample container from the auger. Repeat the augering process until the desired sample interval has been augered and placed into the stainless steel bowl.

Backfilling Sample Locations:

Backfill in accordance with federal and state regulations including OAR 690-240 (e.g., bentonite requirements). The soils from the excavation will be used as backfill unless project-specific or state requirements include the use of clean backfill material.